US005724660A

United States Patent [19]

Kauser et al.

[11] Patent Number: 5,724,660

[45] Date of Patent: Mar. 3, 1998

[54] **METHOD AND APPARATUS FOR LOCATING A MOBILE STATION BY COMPARING CALCULATED LOCATION AREA WITH GPS COORDINATES**

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[21] Appl. No.: **603,793**

[22] Filed: **Feb. 20, 1996**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 472,082, Jun. 7, 1995.

[51] Int. Cl.^{6} **G01C 21/00; G01S 3/02; H04B 7/26**

[52] U.S. Cl. **455/456**; 455/67.1; 364/449.8; 342/451

[58] **Field of Search** 455/54.1, 56.1, 455/67.1, 33.1, 33.4, 33.2, 67.6, 524, 456, 457, 440; 379/59, 60; 342/457, 357, 451, 452, 450, 463; 364/449.1, 449.8, 449.9, 449.95, 449.7

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[57] **ABSTRACT**

A method and apparatus for determining the location of a mobile telephone within the serving area of a mobile telephone system. A mobile switching center analyzes the calling mobile telephone number and called telephone number to determine if a location function is required. Upon initiation of the location function by the mobile switching center, a mobile location module calculates a location estimate of the mobile telephone. The mobile location module receives a list of signal strengths received by the mobile telephone from cell site antennas within the serving area. The distance between the mobile telephone and a plurality of cell site antennas is calculated using a technique which reduces the error component of the calculated distances. These reduced error distances are used to geometrically determine an estimate of the location area. In addition, the mobile telephone comprises a GPS receiver/processor for sending the most recent GPS coordinates of the mobile telephone which are within a predetermined confidence level to the mobile location module. These GPS coordinates are compared with the calculated location area to increase the accuracy of the location determination.

32 Claims, 6 Drawing Sheets